



Australian Bureau of Statistics

CensusAtSchool Australia

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Resources



CaSQ 24C - Using a Trend Line to find a Relationship Between Height and Foot Length

You can download this activity as a rich text file (RTF) using the link at the bottom of the page.

How to: Get a Random Sample from CensusAtSchool

Go to the CensusAtSchool Random Sampler to download a sample.

Reference year: *(Select year)* **Sample size:** *At least 30 students*

Select questions: *Height, Foot length*

Location: *Select location* **Year level:** *(Select a range of year levels)*

To protect privacy there is a rule built into the sampler that the requested sample size cannot exceed 10% of the respondents for the parameters entered.

Task:

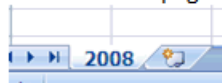
From CasQ 24A and CaSQ 24B you are going to use a scatter plot and trend line to test Tilly's assertion that a person's height is 7 times their foot length.

Creating a scatter plot in Excel 2007

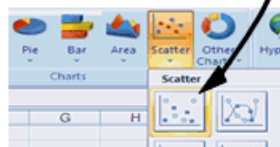
1. Move your cursor to the top of the columns until you have an arrow. Click to select both columns. Right click or go to Home and select Copy.

Height	RightFoot
144	23
164	23
184	28
158	22
174.5	26.5

2. Select a new sheet from the tab at the bottom of the page and paste your data.



3. Select the columns for Height and Foot Length. Go to Insert and select 'Scatter with only Markers' to draw your graph.

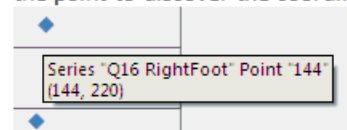


Variability and errors

While it is reasonable to expect a certain amount of variation in people's height and foot length, there may be some values in the sample that are obviously outside this reasonable range.

These values, known as outliers, may have been caused by error in the input and need to be removed.

4. Identify any points in your scatter plot you believe are caused by errors in your data. Do this by hovering your cursor over the point to discover the coordinates.



Select each error in your data set.

94	137.5	20.9
93	144	220
94	170	26.5

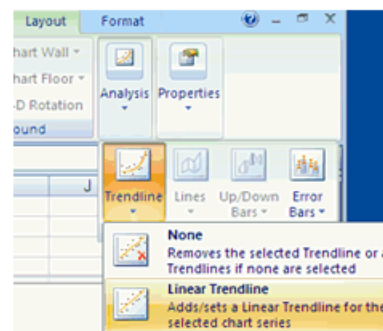
Go to the Home menu, select Delete then Delete Sheet Rows to remove each error pair from your scatter plot.

5. Adjust the axes to get the best possible view of your scatter plot. The best view will have the minimum amount of white space. Go to the Layout Tab choose Axes then Primary Horizontal (or Vertical) Axis and then More Primary Axes Options.

[More Primary Vertical Axis Options...](#)

Creating a trend line

6. Obtain a trend line by selecting the graph then going to the Layout Tab > Analysis > Trend line> Linear Trend line



7. Click on three of the original data points that appear on, or very near, the trend line. Enter the values into a table on your spread sheet. In the third column use Excel to calculate how many times bigger height is than the foot length.

	height	foot length	height/foot
1	138	22.5	6.133333
2			
3			

Find the mean of these three calculations.

8. Use the mean found in question 7 to answer how many times greater a person's height is than their foot length.

9. Find the foot length of 3 people in your class. Use your result to estimate their height.

10. Find the height of three different people and use your result to estimate their foot length.

11. Write a report of your investigation including:

- how accurate you think your result is,
- what factors may affect the accuracy of your result,
- whether a trend line is a useful tool for making predictions, and
- a discussion of how you could obtain a result that more accurately described the relationship between height and foot length for a particular sample of people.

Download the full activity:

RTF

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